

Comparative Study between Taping Mechanism with Customized Foot Orthosis and Prefabricated Foot Orthosis in Plantar Fasciitis: A Literature Review

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ABSTRACT

Background: Plantar Fasciitis is caused by repetitive micro tearing of the plantar fascia and it is one of the most common foot complaints. The common characteristics of plantar fasciitis are pain and tenderness under the heel on weight bearing which results in limitations of physical activity. Initial treatment of plantar fasciitis always consists of conservative methods. More than 90% of patients respond favourably to conservative treatment, but symptoms often improve gradually, and complete resolution can take many months.

Aim: Aim of the review is to compare the effects taping mechanism with customized foot orthosis and prefabricated foot orthosis in plantar fasciitis.

Method and materials: Data sources-Electronic databases were searched (ovid [medline], embase, amed, pubmed, sportdiscus, cinahl, mantis, cochrane library, ausport and the index to chiropractic literature) from January, 2000 to December, 2016 using a predefined search strategy.

Study selection-rcts, prospective.

Types of participants:- We planned to include patients who were diagnosed and management age between 19 to 55 years with unilateral plantar fasciitis, and pain is typically felt on the first step in the morning. We excluded bilateral plantar fasciitis.

Types of intervention:- We included all types of taping management for plantar fasciitis, customized foot orthosis and prefabricated foot orthosis for plantar fasciitis.

Types of outcome measure:- We examined outcome over the long term follow up.

Outcome measures:- Pain and foot function index. Data Extraction: The data were extracted independently by authors using the same data extraction table 1. The data tables were then compared and any difference in the data collection was further scrutinized until resolution was found. Demographic data were collected pertaining to the subjects within the selected studies, as were the outcome measures utilized and the results of the within-group changes for each treatment arm of interest. Data relevant to the information utilized by the PEDro instrument were also collected.

Discussion and conclusion: Foot orthoses having more positive result for treatment of plantar fasciitis. Low dye taping is used as a temporary support. Most of the study was in favoured for foot orthoses.

Keywords: Plantar Fasciitis; Orthoses; Prefabricated Foot Orthosis; Inflammatory

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INTRODUCTION

Plantar Fasciitis is caused by repetitive micro tearing of the plantar fascia. It is currently thought to be a degenerative condition. This was previously viewed as an inflammatory condition [1]. The plantar fascia is mainly responsible for maintaining the structural integrity of the foot [2]. It is a thickened fibrous aponeurosis forms the longitudinal foot arch by originating from the medial tubercle of the calcaneus [3] and runs forward to be inserted through several slips into the plantar plates of the metatarso-phalangeal joints, the bases of the proximal phalanges of the toes and the flexor tendon sheaths [4]. Its key role includes static support of the medial longitudinal arch by creating tension between the proximal and distal aspects of the foot and dynamic shock absorption [3].

Plantar fasciitis is one of the most common foot complaints [5] and affects 1 million patients in America who visit per year to office based physicians and hospital [6]. This disorder is particularly prevalent in runners [7,8] and affects approximately 25% of all foot injuries in runners [9] and up to 8% of all injuries to people participating in sporting activities [10]. It affects active working adults between the ages of 25 and 65 years old [6]. Plantar fasciitis is usually unilateral, but it's bilateral in up to 15% of patients [4].

The common characteristics of plantar fasciitis are pain and tenderness under the heel on weight bearing which results in limitations of physical activity [11]. Pain is worst with the first few steps in the morning, patients often notice pain at the beginning of activity that lessens or resolves as they warm up. The pain may also occur with prolonged standing and is sometimes accompanied by stiffness. In more severe cases, the pain will also worsen toward the end of the day [3]. Patients sometimes describe contra lateral pain when weight is shifted to the other leg [4].

Some of the factors that frequently believed to precipitate plantar fasciitis includes faulty Biomechanics such as excessive pronation, structural deformities such as forefoot varus, higher-arched foot, low arched foot, flattening of the medial arch with excessive pronation, rearfoot varus, anatomical risk factor such as discrepancy in leg length, excessive lateral tibial torsion and excessive femoral anteversion, Functional risk factors include tightness and weakness in the gastrocnemius, soleus, achilles tendon and intrinsic foot muscles [12] and other factors that causes plantar fasciitis are training error, excessive weight, age related degenerative changes, occupations requiring prolonged standing or ambulation. Presence of these risk factors causes excessive tensile forces which may cause micro-tears in the plantar fascia [13].

Initial treatment of plantar fasciitis always consists of conservative methods. More than 90% of patients respond favourably to conservative treatment, but symptoms often improve gradually, and complete resolution can take many months [14]. Conservative treatment for plantar fasciitis focuses

on decreasing pain, promoting healing, restoring range of motion and strength, correcting training errors, limiting biomechanical deviations caused by structural abnormalities, and maximizing good nutrition [15].

Conservative treatment include anti-inflammatory agents (NSAIDs, steroid injections), modalities (iontophoresis, ultrasound, extracorporeal shock wave therapy, electrical stimulation, cryotherapy and whirlpool), manual therapy (joint and neural mobilizations, massage), stretching (including night splints), and external support (orthotic, Unna boot, walking fracture splint, cast to resist foot elongation, roller-soled shoes, non-weight bearing using crutches and taping), a weight loss program, reduced activity (activity restriction) and properly fitted shoe [16]. Among this low dye taping, prefabricated foot orthosis and customized foot orthosis features regularly. Therefore, the aim of this review was to investigate the efficacy of low dye taping techniques and customized and prefabricated foot orthosis in relieving symptoms and dysfunction caused by plantar fasciitis.

For this paper, only published randomized clinical trials that included at least one of the above mentioned conservative care modalities in the treatment of plantar fasciitis (or plantar heel pain syndrome, heel spur syndrome, or painful heel syndrome) were reviewed. These forms of treatment were chosen for this review as they are the modalities that chiropractors are most likely to use when treating a patient with plantar fasciitis.

METHODOLOGY

Data sources

Electronic databases were searched (Ovid [Medline], EMBASE, AMED, PubMed, Sport Discus, CINAHL, MANTIS, Cochrane Library, AUSPORT and the index to chiropractic literature) from January, 2000 to December, 2016 using a predefined search strategy.

The following search term combinations were used:

1. Plantar fasciitis, heel pain,
2. Chiropractic,
3. Taping,
4. physical therapy/physiotherapy,
5. Stretching,
6. Soft foot orthosis,
7. Ice, heat, exercise, and orthotics,
8. Conservative management of plantar fasciitis,
9. Orthotic or orthoses or functional foot orthotic or functional foot orthoses or insert* or insole* and plantar fasciitis or anterior medial heel pain or plantar heel pain or heel spur syndrome or painful heel syndrome or plantar aponeurosis.

Table 1: Methodological quality of selected articles according to the PEDro scale

Sl. No		Roos et al, 17	Landorf et al, 18	Walther et al, 19	Markus Walther et al. 2013, 20	El Salam and Elhafj et al. 21	Karl Landorf al.22	B. et Radford et al, 23	ValériaBaldassin, 24	Abd El & Abd ELhafz 25	Dimou and colleagues 26
1	eligibility criteria were specified	√	√	-	-	√	√	√	√	√	-
2	randomly allocated	√	-	√	√	√	√	√	√	√	√
3	concealed allocation	-	-	-	√	-	√	√	~	~	-
4	baseline comparability	√	√	√	-	√	√	√	√	√	√
5	Blind subjects	-	-	~	-	√	x	√	√	√	-
6	blind therapists	-	-	~	-	√	√	√	√	√	-
7	blinding assessors	√	-	~	-	√	x	~	~	~	√
8	Adequate follow up	√	√	√	√	√	√	√	√	√	√
9	“ intention to treat ” analysis	√	-	-	-	√	√	√	√	√	-
10	between-group statistical comparisons	√	√	√	√	√	√	√	√	√	√
11	point estimates and variability	√	√	-	-	√	√	√	√	√	-
	Total score	6	5	4	4	8	8	9	8		5

Study selection

RCTs, prospective.

Types of participants

We planned to include patients who were diagnosed and management age between 19 to 55 years with unilateral plantar fasciitis and pain is typically felt on the first step in the morning. We excluded bilateral plantar fasciitis.

Types of intervention

We included all types of taping management for plantar fasciitis, customized foot orthosis and prefabricated foot orthosis for

plantar fasciitis. We planned to compare taping mechanism with customized foot orthosis and prefabricated foot orthosis.

Types of outcome measure

We examined outcome over the long term follow up.

Outcome measures

Pain and foot function index.

All retrieved articles were also hand-searched for additional published citations not found through the literature search. Titles and abstracts of all articles were reviewed.

The objective of this review was to determine among low dye taping, customized foot orthosis and prefabricated foot orthosis which had the best outcomes for plantar fasciitis patients.

The methodological quality of randomized controlled interventional studies was evaluated inter alia by the PEDro score. The methodological quality of a trial was defined as high when five or more items on the PEDro scale received a positive score.

Trials of any methodological quality were included. These searches yielded a total of 730 articles.

Data extraction

The data were extracted independently by authors using the same data extraction table. The data tables were then compared and any difference in the data collection was further scrutinized until resolution was found. Demographic data were collected pertaining to the subjects within the selected studies, as were the outcome measures utilized and the results of the within-group changes for each treatment arm of interest. Data relevant to the information utilized by the PEDro instrument were also collected.

Search results

El Salam and Elhafz et al. [16] reported that, Patients in the LDT group showed significant reduction in pain intensity as well as significant improvement in pain related foot disability post experimentally when compared with the pre-experimental evaluation. In this study it was also found that, Patients in the

MAS group, similarly, showed significant reduction of pain intensity, and pain-related disability improved post-experimentally when compared with the pre-experimental evaluation.

The follow-up of the patient in their study they found, both groups presented similar improvement considering the components of modified FFI (Table 2) and pain to palpation. In regards to modified FFI pain, there was a significant improvement in both groups (P_.05, F_5.18) without a difference between them (Table 2). On both occasions, the prefabricated group exhibited higher scores of modified FFI pain, but the differences, adjusted to baseline values, between groups at the 4th and 8th weeks were negligible (4.0 points [95% CI, _4.2 to 12.3; P_.337) and 3.9 points (95% CI, _4.6 to 12.5; P_.363), respectively (see table 2). The minimal clinically important difference used for this evaluation was 13 points. During all follow-up (4th and 8th weeks), the upper limits of the CI excluded this minimal clinically important difference. There was no statistical difference between groups in their belief of the type of orthotic provided; 81% from the prefabricated and 84% from the customized group believed they were using a customized foot orthosis (_2_0.01, P_.92). However, physiotherapists were more evenly divided in their belief of orthotic type; 58% correctly identified the prefabricated group and 48% correctly identified the customized group (_2_0.48, P_.49). In terms of the outcomes considered, the study did not show any statistically significant difference in pain regardless of the type of foot orthoses used after 4 or 8 weeks

Table 2: Characteristic of subjects.

Author	Year	Study design	Sample size	Age (years)	Pain duration (months)	Study group intervention	Control group intervention	PEDro score	Results
UfukYucel et al.	2013	RCT	42	46.4 ± 8.7	> 3	Ultrasound guided corticosteroid injection	Full length silicon insoles		Pain was reduced in ultrasound guided injection
Walther et al.	2013	Prospective, randomized, head to head trial	30	51.6 ±12.5, 53.8 ±13.2, 53.9±14.9	More than 8 weeks	Thin, non-supportive orthotic	Soft supportive foam insert, Foam covered rigid self-supporting plastic orthotic		After 3 weeks maximum pain reduction was in group 3 that is in patients who were using Foam covered rigid self-supporting plastic orthotic
El Salam and Elhafz et al.	2011	RCT	30	52.8	> 0.08	Low dye taping + US + calf muscle stretching	Medial arch support + US + calf muscle stretching	9	Statistically significant improvement in both groups compared to baseline. Statistically significant improvement in MAS group compared to the LDT group. Results indicate that MAS is more convenient for short-term management of pain and

									disability in patients with plantar fasciitis than LDT.
Valéria Baldassin et al.	2009	RCT DOUBLE BLINDED	142				prefabricated and customized foot orthosis	8	the study did not show any statistically significant difference in pain regardless of the type of foot orthoses used after 4 or 8 weeks
Radford et al.	2007	RCT	92	50 ± 14	≥ 4 weeks	low-Dye taping and sham ultrasound	sham ultrasound alone	8	Participants treated with low-Dye taping reported a small improvement in 'first-step' pain after one week of treatment compared to those who did not receive taping. The estimate of effect on 'first-step' pain favored the low-Dye tape. There were no other statistically significant differences between groups. Thirteen participants in the taping group experienced an adverse event however most were mild to moderate and short-lived.
Karl B. Landorf	2006	RCT	136	48.5 (9.6), 47.3 (11.6), 49.2 (12.0)	At least 4 weeks	prefabricated and customized foot orthosis	sham orthosis	8	Prefabricated orthoses and customized orthoses produced small short-term benefits.
Roos et al.	2006	RCT	43	46	Median symptoms duration were 4.2 months	Customized foot orthosis	Customised foot orthosis + anterior night splint , anterior night splint	8	Foot orthoses and anterior night splints were effective both short-term and long-term in treating pain from plantar fasciitis. Parallel improvements in function, foot-related quality of life, and a better compliance suggest that a foot orthosis is the best choice for initial treatment plantar fasciitis.
Dimou and colleagues	2004	RCT	20	Between 18 & 60 years	8 weeks	chiropractic adjustments of the foot and ankle	CFO	05	Homogeneity was found for intra-group comparison (improvement) with both Group 1 (manipulation and stretch) and Group 2 (orthotics) with significant differences observed on pain scale worst (G1 p=0.000 and G2 p=0.000), heel pain during leisure (G1 p=0.008 and G2 p=0.16), and algometer readings

(G1 p=0.004 and G2 p=0.000). For the inter-group measurements, the only reading that revealed significant difference was the pain scale worst measurement on 15, with Group 1 (manipulation and stretching) being superior) earlier to Group 2 (orthotics)

According to Radford et al. [17] both the taping and sham groups improved in 'first-step' pain, foot pain and foot function at follow-up. Only for 'first-step' pain did the taping group experience a greater improvement compared to the sham group (ANCOVA adjusted mean difference -12.3 mm; 95% confidence interval -22.4 to -2.2). This difference was statistically significant (p=0.017). Although there were small differences between groups with respect to improvements in the Foot Health Status Questionnaire none were statistically significant. With respect to blinding, thirty-eight participants (83%) in the taping group correctly identified their treatment group compared with three participants (7%) in the sham group. Five participants (11%) in the taping group were uncertain which treatment they received, compared with twenty participants (43%) in the sham group and three participants (7%) the taping group and twenty-three participants (50%) in the sham group incorrectly identified their treatment group. The index to assess the success of blinding was computed to be 0.61 (bootstrap 95% confidence interval 0.54 to 0.69). The value of 0.61 represents a statistically significant amount of blinding beyond that expected by chance and demonstrates an acceptable level of blinding for a trial using sham ultrasound.

Karl b landrof et al. [18] found in his study that There were no differences in follow-up times between the groups at either the 3-month (p=.37) or 12-month (p=.83) reviews. For the 3-month review, the number of days (median [interquartile range]) for the groups were sham, 92 (88-103); prefabricated, 90 (84-100); and customized, 91 (85-98). For the 12-month review, the number of days (median [interquartile range]) was 375 (371-383) for the sham group; 373 (369-387) for the prefabricated group; and 373 (371-382) for the customized group. All 3 groups experienced improvements in pain and function at 3 and 12 months compared with baseline, but differences between groups were small. The prefabricated and customized groups demonstrated benefits in the short term (i.e., at 3 months) compared with the sham, but not in the long term (i.e., at 12 months). The intention-to-treat analysis at 3 months demonstrated that the prefabricated and customized groups had greater improvements in pain than the sham group: adjusted mean differences of 8.7 points (95% confidence interval [CI], -0.1 to 17.6) for the prefabricated group and 7.4 points (95% CI, -1.4 to 16.2) for the customized group. These differences were not statistically significant, although the prefabricated device approached significance (p=.05 and .10, respectively). The mean difference for pain between the prefabricated and customized groups was

negligible (adjusted mean difference of 1.3; 95% CI, -7.6 to 10.2).

Table 3: Included and excluded randomized controlled trials.

Sl. No	Article	Included/Excluded
01.	UfukYucel et al.	Excluded
02.	Walther et al.	Excluded
03.	El Salam and Elhafz et al.	Included
04.	ValériaBaldassin	Included
05.	Radford et al.	Included
06.	Karl B. Landorf	Included
07.	Roos et al.	Included
08.	Dimou & colleagues	Excluded

Roos et al. [19] found All groups improved significantly in all five FAOS subscales across all times, p<0.04. At 12 weeks, pain reductions of 30% to 50% compared to baseline were seen in the three groups (p<0.03). On an individual level, eight of nine patients in the orthosis only group improved clinically (>10 points) compared to eight of 11 in the combined group and 10 of 14 in the splint only group. Similar results were seen for improvement in the other FAOS subscales covering other symptoms, function in daily life, sport and recreation function, and foot and ankle related quality of life. The improvement continued over time. With the numbers available, no significant differences were found in pain among the three groups at any point in time (p=0.12 to 0.89). When comparing the orthosis-only group and the splint-only group a clinically important (>10 points) but nonsignificant difference in sport and recreation after 26 weeks of treatment was seen (88 compared to 67, p=0.08). At 52 weeks, a significantly higher pain reduction of 62% was reported for the two groups treated with orthoses (alone or in combination with splint), compared to a pain reduction of 48% for the splint alone group (p<0.01).

DISCUSSION

Theory behind the use of low dye taping is that supportive tape reduces the symptoms of plantar heel pain by reducing strain in the plantar fascia during standing and ambulation. A reduction in strain is achieved by reducing navicular drop upon weight bearing (i.e. arch collapse). Low-Dye tape has been reported as an alternative for achieving mechanical support of foot arches, correction of foot pronation, and controlling mobility of the rear foot. Low-Dye taping techniques are reported to be short-term interventions, used as a temporary support until custom-made orthosis is applied. The aim of this review was to investigate the efficacy of low dye taping techniques and customized and prefabricated foot orthosis in relieving symptoms and dysfunction caused by plantar fasciitis. Low dye taping and foot orthosis both improved the pain and foot related disability. This review leads to discussion of three areas: Pain, Pain related disability and foot related quality of life.

In pain reduction, Customised Foam covered rigid self-supporting plastic orthotic shows maximum pain reduction after 3 weeks of use. Medial arch support (MAS) and low dye taping (LDT) both shows significant improvement in pain, but MAS shows better improvement than LDT. Regarding prefabricated and customized both did not show any significant differences in Pain reduction and Modified FFI. Use of LDT reduces only first step pain after one week of use compared to sham orthosis or ultrasound. When comparing prefabricated orthosis, customized orthosis and sham orthosis, both the prefabricated and customized orthosis only provide small short term benefit over the sham orthosis during follow up. Another study suggested that foot orthosis is the best for the initial treatment of plantar fasciitis.

Summary

The overview of the review study expresses the importance and successes rate of non-operative treatments for PF is more effective along with orthotic treatment.

1. The significant cause of PF is micro tearing as an excessive load.
2. And most common clinical outcomes are pain and tenderness over heel portion of the foot.
3. Plantar fasciitis is functionally indicated to support medial longitudinal arch support during static and dynamic condition.
4. For the cause of PF pathomechanics of the foot derived into foot deformities.
5. Lager tensile force also develops in foot muscle and tendon in PF.
6. The current used non-operative treatment methods aim is to relieve pain promoting healing by providing static and dynamic support and absorbed shock/shifted GRF from PF areas and also maintain the alternative loose packed and close packed position of the foot joints.
7. Among all this study in this review orthotic non-operative treatment with application of corrective and supportive

biomechanics significantly 90% used along with anti-inflammatory agents, physical therapy and taping casts.

RECOMMENDATIONS

Operative studies are less applied as compare to non-operative treatment. Conflicting reports and noneffective are common in the non-operative treatment of PF. It doesn't have strong evidence.

Mostly orthotic treatment is used with stretching exercise to reduce tensile force and NSAIDS.

LIMITATIONS IN THE LITERATURE

Many of the studies are that many of the modalities were not assessed alone, i.e. they were used in combination with other treatments, thus making it difficult to assess the effectiveness of each individual treatment. This means that further studies are needed that evaluate the effectiveness of the numerous different modalities by themselves and potentially in combination with other treatments to find the most useful and cost-efficient way to treat plantar fasciitis. In addition, very few studies compared interventions to placebo or no-treatment groups, this may be desirable to ensure that an actual treatment effect is being achieved by the different interventions. Long term follow up study is required to be done and very few study compared low dye taping with foot orthoses. More study is required for direct comparisons of low dye taping with foot orthoses.

CONCLUSION

Foot orthoses having more positive result for treatment of plantar fasciitis. Low dye taping is used as a temporary support. Most of the study was in favoured for foot orthoses.

REFERENCES

1. Drake M, Bittenbender C, Boyles RE. The short-term effects of treating plantar fasciitis with a temporary custom foot orthosis and stretching. *J Orthop Sports Phys Ther.* 2011;41(4): 221-231.
2. Pohl MB, Hamill J, Davis IS. Biomechanical and anatomic factors associated with a history of plantar fasciitis in female runners. *Clin J Sport Med.* 2009;19(5): 372-376.
3. Young CC, Rutherford DS, Niedfeldt MW. Treatment of plantar fasciitis. *Am fam Physician.* 2001;63(3): 467-474.
4. Singh D, Angel J, Bentley G, Trevino SG. Fortnightly review: Plantar fasciitis. *Bmj.* 1997;315(7101): 172-175.
5. Riddle DL, Schappert SM. Volume of ambulatory care visits and patterns of care for patients diagnosed with plantar fasciitis: A national study of medical doctors. *Foot & ankle international.* 2004;25(5): 303-310.
6. Warren BL, Jones CJ. Predicting plantar fasciitis in runners. *Med Sci Sports Exerc.* 1987;19: 71-73.
7. Hill JJ, Cutting PJ. Heel pain and body weight. *Foot Ankle.* 1989;9(5): 254-256.
8. Clement DB, Taunton JE, Smart GW, McNicol KL. 1:30 pm: A survey of overuse running injuries. *Phys Sportsmed.* 1981;9(5): 47-58.
9. Lysholm J, Wiklander J. Injuries in runners. *Am J Sports Med.* 1987;15(2): 168-171.

10. Bolgla LA, Malone TR. Plantar fasciitis and the windlass mechanism: A biomechanical link to clinical practice. *J Athl Train.* 2004;39(1): 77.
11. Josh dubin. Biomechanics contribute to the plantar fasciitis, *Biomechanics*, 2007. pp: 39-46
12. Schippert DW, DiGiovanni BF, Baumhauer JF, Flemister AS. Recent updates in the management of plantar fasciitis. *Current Orthopaedic Practice.* 2009;20(2): 130-135
13. Dubin J. Evidence based treatment for plantar fasciitis: Review of literature. *Sports Therapy.* 2007.
14. Prescription Custom Foot Orthoses Practice Guidelines December, 2006 www.acfaom.org ACFAOM Prescription Custom Foot Orthoses Practice Guidelines (2006 Edn) pp: 1-36
15. Walther M, Kratschmer B, Verschl J, Volkering C, Altenberger S, Kriegelstein S, et al. Effect of different orthotic concepts as first line treatment of plantar fasciitis. *Foot Ankle Surg.* 2013;19(2): 103-107
16. El Salam MS, ELhafz YN. Low-dye taping versus medial arch support in managing pain and pain-related disability in patients with plantar fasciitis. *Foot Ankle Spec.* 2011;4(2):86-91.
17. Radford JA, Landorf KB, Buchbinder R, Cook C. Effectiveness of low-Dye taping for the short-term treatment of plantar heel pain: A randomized trial. *BMC Musculoskelet Disord.* 2006;7:64.
18. Landorf KB, Keenan AM, Herbert RD. Effectiveness of foot orthoses to treat plantar fasciitis: A randomized trial. *Arch Intern Med.* 2006;166(12):1305-1310.
19. Roos E, Engström M, Söderberg B. Foot orthoses for the treatment of plantar fasciitis. *Foot Ankle Int.* 2006;27(8): 606-611.